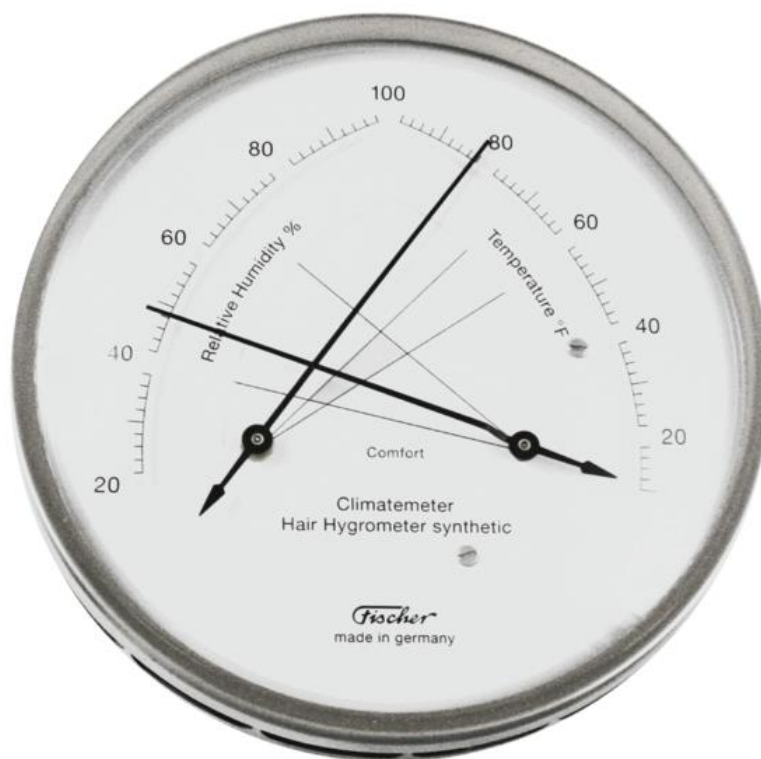


Fischer Instruments 146-01 Stainless Steel Traditional Temperature + Humidity Comfortmeter with Synthetic Hair Hygrometer User Manual



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1. Introduction

Thank you for your purchase of the Fischer Instruments 146-01 Stainless Steel Traditional Temperature + Humidity Comfortmeter with Synthetic Hair Hygrometer. The following is a guide for preparation, care and operation of your marine weather instrument.

Note: Some of the images are generic and may not match your exact model.

2. Installation, Care and Cleaning

To measure exact temperature and humidity, the Comfortmeter must be suspended vertically.

Relative humidity is closely correlated to and dependent upon air temperature, so it provides the best data when not exposed to rapidly changing temperatures. For the best measure of the humidity, avoid placing the instrument in direct sunlight or in line with strong breezes. Locate the instrument in a place that best represents the average temperature of the local environment. Avoid outside walls that might be cooler than average, and avoid direct exposure to heat sources that would be warmer than average.

Avoid use of harsh household cleaners and coarse paper towels, which can scratch the bezel or lens. Fingerprints and dirt may be removed the lenses and bezels with a soft cloth lightly dampened with a mixture of water and mild dishwashing liquid. Be sure to dry the lens and bezel with a soft cloth after cleaning.

3. The ComfortMeter

The calibration and positioning of the hands are designed to indicate perfect comfort conditions in room atmosphere: when both hands cross in a limited area of the dial, or the “COMFORT zone”.

There is no one temperature and humidity condition at which everyone is comfortable. People are comfortable at a range of temperature and humidity. Research conducted over many years on large numbers of people by the American Society of Heating, Refrigeration, and Air Conditioning Engineers concluded there is a range of combined temperature and humidity that provides comfort to most people.

In general, a healthy room climate is optimized at humidity levels between 45 and 60% rh. Your personal comfort zone may vary based on your climate, season, body type and activity.

3.1 How the Hygrometer Works

The hygrometer measures the indoor relative humidity.

The sensor element is a specially treated synthetic fiber whose length is sensitive to the humidity in the air. For a given tension on the fiber bundle, the length increases with increasing relative humidity. Changes in its length are then magnified with precision gears to display the relative humidity of the air.

In contrast to real hair hygrometers, which must be chemically cleaned and rejuvenated often, this synthetic-fiber model provides the same high precision and fast response time without that required maintenance.

Hygrometers register the percentage of water vapor present in the air, compared to the maximum amount that can be present at a given temperature.

It is not uncommon to have low humidity reading during cold weather when indoor air is heater. Air conditioning also removes moisture from the air. The optimum levels are 45% to 50% during heating and cooling seasons. Low humidity can cause health problems and can be hard on wood furnishings. High humidity can cause mold or mildew to grow.

3.2 Hygrometer Accuracy

Humidity measurement is among the more difficult problems in basic meteorology. Accuracy is difficult to achieve. This sensor is accurate to $\pm 3\%$, which only the best hygrometers can achieve.

A further difficulty is that most hygrometers sense relative humidity rather than the absolute amount of water present, but relative humidity is a function of both temperature and absolute moisture content, so small temperature variations within the air will translate into relative humidity variations.

3.3 Humidity Calibration

The hygrometer has been calibrated at the factory. Over time, humidity will drift. This small drift is inconsequential for most applications, and it is rare that a household application will ever require calibration.

For laboratory applications that require exact measurements, humidity calibration is recommended once per year.

We recommend using a sling-psychrometer to measure humidity exactly. A sling-psychrometer is a mechanical device that measures wet bulb and dry bulb temperature, which is used to calculate the exact relative humidity.

1. Perform regeneration of the synthetic hair fibers as specified in Section 3.4.
2. After regeneration, allow the comfortmeter to stabilize to ambient room conditions for at least one hour prior to calibration.
3. Use a sling-psychrometer to measure the exact humidity.
4. With a precision screwdriver, slowly adjust the set screw clockwise to increase the humidity to match the exact humidity. Slowly adjust the set screw counter-clockwise to decrease the humidity to match the exact humidity.

Do not to breathe on the instrument during calibration. This will affect your results.

3.4 Humidity Maintenance

The regeneration of the synthetic hair fibers (wrapping the hygrometer in a damp cloth) is not absolutely necessary but still recommended for precise measurements once per year.

Wrap the entire comfortmeter in a damp-warm cloth (do not use steam or hot water). Allow to stabilize for one hour. The humidity should read between 95 and 98% when completed. If it does not, humidity calibration can be performed.

3.5 Dial Thermometer

The dial thermometer uses a bimetallic strip wrapped into a coil. One end of the coil is fixed to the housing of the device and the other drives an indicating needle. The principle behind a bimetallic strip thermometer relies on the fact that different metals expand at different rates as they warm up. By

bonding two different metals together, the coil bends, causing the needle to move. Bimetallic thermometers are not as accurate as bulb (mercury or red spirit) thermometers. The dial thermometer requires no calibration.

4. Accuracy

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Graduation
Temperature	10 to 100 °F	± 2 °F	2
Humidity	20 to 100%	± 3 %	2

5. Warranty Information

Ambient, LLC provides a 5-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased and only to the original purchaser of this product. To receive warranty service, the purchaser must contact Ambient, LLC for problem determination and service procedures.

Warranty service can only be performed by a Ambient, LLC. The original dated bill of sale must be presented upon request as proof of purchase to Ambient, LLC.

Your Ambient, LLC warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (lack of reasonable and necessary maintenance); (2) damage resulting from failure to follow instructions contained in your owner's manual; (3) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (4) units used for other than home use (5) applications and uses that this product was not intended, such as outdoor use.

This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

6. Liability Disclaimer

Reading the "User manual" is highly recommended. The manufacturer and supplier cannot accept any responsibility for any incorrect readings and any consequences that occur should an inaccurate reading take place.

The specifications of this product may change without prior notice.

This product is not a toy. Keep out of the reach of children.

No part of this manual may be reproduced without written authorization of the manufacturer.

Ambient, LLC WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT.

